Listing of the Claims

1.(Currently Amended) A method of displaying an image with a display device, the method comprising:

receiving image data for the image on a high resolution~~diamond~~ grid;

generating a first sub-frame and a second sub-frame corresponding to the image data, the first and the second sub-frames each generated on a low resolution diamond grid; and

alternating between displaying the first sub-frame in a first position and displaying the second sub-frame in a second position spatially offset from the first position.

2.(Currently Amended) The method of claim 1, wherein the first sub-frame and the second sub-frame are displayed on a low resolution quincunx display that includes diamond-shaped pixels.

3.(Original) The method of claim 1, wherein the first sub-frame and the second sub-frame are generated based on minimization of an error between the image data and a simulated image.

4.(Original) The method of claim 3, wherein the simulated image is based on upsampling of the first and the second sub-frames, thereby generating upsampled sub-frame data.

5.(Original) The method of claim 4, wherein the upsampled sub-frame data includes first and second upsampled sub-frames, and wherein the simulated image is based on shifting of pixels in the first upsampled sub-frame, thereby generating a first shifted sub-frame, and wherein the simulated image is based on convolutions of the first shifted sub-frame and the second upsampled sub-frame with an interpolating filter.

6.(Original) The method of claim 4, wherein the simulated image is based on a convolution of the upsampled sub-frame data with an interpolating filter.

7.(Original) The method of claim 1, and further comprising:

transforming the image data to a rectangular grid.

8.(Original) The method of claim 7, wherein the image data is transformed to a rectangular grid by rotating the image data by forty-five degrees.

9.(Original) The method of claim 7, and further comprising:

padding the transformed image data with pixels having a value of zero, thereby forming a rectangular-shaped image on the rectangular grid.

10.(Original) The method of claim 9, wherein the first sub-frame and the second sub-frame are generated based on minimization of an error between the rectangular-shaped image and a simulated image.

11.(Original) The method of claim 10, wherein the first sub-frame and the second sub-frame are first generated on a rectangular grid and then transformed to a diamond grid for display.

12.(Currently Amended) The method of claim 1, and further comprising:

generating a third sub-frame and a fourth sub-frame corresponding to the image data, the third and the fourth sub-frames each generated on a low resolution diamond grid; and

wherein alternating between displaying the first sub-frame and displaying the second sub-frame further includes alternating between displaying the first sub-frame in the first position, displaying the second sub-frame in the second position, displaying the third sub-frame in a third position spatially offset from the first position and the second position, and displaying the fourth sub-frame in a fourth position spatially offset from the first position, the second position, and the third position.

13.(Currently Amended) A system for displaying an image, the system comprising:

a buffer adapted to receive image data for the image on a ~~diamond~~high resolution grid;

an image processing unit configured to define first and second sub-frames corresponding to the image data, the first and the second sub-frames each defined on a low resolution diamond grid; and

a display device adapted to alternately display the first sub-frame in a first position and the second sub-frame in a second position spatially offset from the first position.

14.(Original) The system of claim 13, wherein the image processing unit is configured to define the first and the second sub-frames based on minimization of an error between the image data and a simulated image.

15.(Original) The system of claim 13, wherein the image processing unit is configured to transform the image data to a rectangular grid.

16.(Original) The system of claim 15, wherein the image processing unit is configured to transform the image data to a rectangular grid by rotating the image data by forty-five degrees.

17.(Original) The system of claim 15, wherein the image processing unit is configured to pad the transformed image data with pixels having a value of zero, thereby forming a rectangular-shaped image on the rectangular grid.

18.(Original) The system of claim 17, wherein the image processing unit is configured to define the first sub-frame and the second sub-frame based on minimization of an error between the rectangular-shaped image and a simulated image.

19.(Original) The system of claim 18, wherein the first sub-frame and the second sub-frame are first defined on a rectangular grid and then transformed to a diamond grid for display.

20.(Original) The system of claim 14, wherein the simulated image is based on upsampling of the first and the second sub-frames.

21.(Original) The system of claim 20, wherein the simulated image is based on shifting of pixels in the upsampled first sub-frame, thereby generating a first shifted sub-frame, and convolutions of the first shifted sub-frame and the upsampled second sub-frame with an interpolating filter.

22.(Original) The system of claim 20, wherein the simulated image is based on a convolution of the upsampled first and second sub-frames with an interpolating filter.

23.(Currently Amended) The system of claim 13, the display device is a low resolution quincunx display that ~~wherein the first sub-frame and the second sub-frame~~ includes diamond-shaped pixels.

24.(Currently Amended) The system of claim 13, wherein the image processing unit is configured to define a third sub-frame and a fourth sub-frame corresponding to the image data, the third and the fourth sub-frames defined on a low resolution diamond grid; and

wherein the display device is configured to alternate between displaying the first sub-frame in the first position, displaying the second sub-frame in the second position, displaying the third sub-frame in a third position spatially offset from the first position and the second position, and displaying the fourth sub-frame in a fourth position spatially offset from the first position, the second position, and the third position.

25.(Currently Amended) A system for generating low resolution sub-frames for display at spatially offset positions to generate the appearance of a high resolution image, the system comprising:

means for receiving a first high resolution image on a ~~diamond~~high resolution grid;

means for storing a relationship between sub-frame values and high resolution image values, the relationship based on minimization of an error metric between the high resolution image values and a simulated high resolution image that is a function of the sub-frame values; and

means for generating a first plurality of low resolution sub-frames based on the first high resolution image and the stored relationship, each low resolution sub-frame generated on a diamond grid.

26.(Original) The system of claim 25, wherein the means for generating is configured to transform the first high resolution image to a rectangular grid.

27.(Original) The system of claim 26, wherein the means for generating is configured to pad the transformed first high resolution image with pixels having a value of zero, thereby forming a rectangular-shaped image on the rectangular grid.

28.(Original) The system of claim 27, wherein the means for generating is configured to generate the first plurality of sub-frames based on minimization of an error between the rectangular-shaped image and the simulated image.

29.(Original) The system of claim 28, wherein the first plurality of sub-frames are first generated on a rectangular grid and then transformed to a diamond grid for display.

30.(Currently Amended) A computer-readable medium having computer-executable instructions for performing a method of generating low resolution sub-frames for display at spatially offset positions to generate the appearance of a high resolution image, comprising:

receiving a first high resolution image on a ~~diamond~~high resolution grid;

providing a relationship between sub-frame values and high resolution image values, the relationship based on minimization of a difference between the high resolution image values and a simulated high resolution image that is a function of the sub-frame values; and

generating a first plurality of low resolution sub-frames based on the first high resolution image and the relationship between sub-frame values and high resolution image values, the first plurality of low resolution sub-frames generated on a diamond grid.

31. (New) The method of claim 1, wherein the high resolution grid is a rectangular grid.

32. (New) The method of claim 31, further comprising transforming the rectangular grid to a high resolution diamond grid.

33. (New) The method of claim 1, wherein the high resolution grid is a diamond grid.

34. (New) The method of claim 2, wherein the displayed first sub-frame and the displayed second sub-frame are shifted relative to each other in quick succession using two-position processing to create a human visual system higher resolution image.

35. (New) The method of claim 1, wherein the first sub-frame and the second sub-frame are generated based on a bilinear algorithm from the high-resolution grid.

36. (New) The method of claim 1, wherein the first sub-frame and the second sub-frame are generated based on a nearest neighbor algorithm from the high resolution grid.

37. (New) The system of claim 13, wherein the high resolution grid is a rectangular grid.

38. (New) The system of claim 37, further comprising transforming the rectangular grid to a high resolution diamond grid.

39. (New) The system of claim 13, wherein the high resolution grid is a diamond grid.

40. (New) The system of claim 23, wherein the displayed first sub-frame and the displayed second sub-frame are shifted relative to each other in quick succession using two-position processing to create a human visual system higher resolution image.

41. (New) The system of claim 13, wherein the first sub-frame and the second sub-frame are generated based on a bilinear algorithm from the high-resolution grid.

42. (New) The system of claim 13, wherein the first sub-frame and the second sub-frame are generated based on a nearest neighbor algorithm from the high resolution grid.

43. (New) The system of claim 25, wherein the high resolution grid is a rectangular grid.

44. (New) The system of claim 43, further comprising transforming the rectangular grid to a high resolution diamond grid.

45. (New) The system of claim 25, wherein the high resolution grid is a diamond grid.

46. (New) The system of claim 25, wherein the first plurality of low resolution sub-frames are generated based on a bilinear algorithm from the high-resolution grid.

47. (New) The system of claim 25, wherein the first plurality of low resolution sub-frames are generated based on a nearest neighbor algorithm from the high resolution grid.

48. (New) The computer readable medium of claim 30, wherein the high resolution grid is a rectangular grid.

49. (New) The computer readable medium of claim 48, further comprising transforming the rectangular grid to a high resolution diamond grid.

50. (New) The computer readable medium of claim 30, wherein the high resolution grid is a diamond grid.

51. (New) The computer readable medium of claim 30, wherein the first plurality of low resolution sub-frames are generated based on a bilinear algorithm from the high-resolution grid.

52. (New) The system of claim 30, wherein the first plurality of low resolution sub-frames are generated based on a nearest neighbor algorithm from the high resolution grid.